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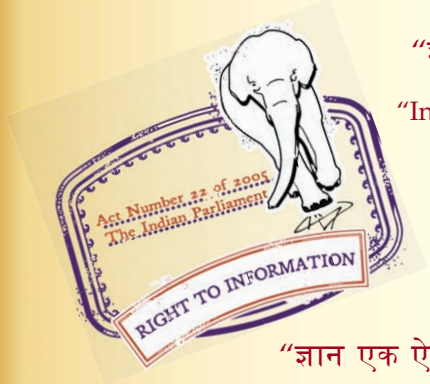

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"Knowledge is such a treasure which cannot be stolen"

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Indian Standard

SPECIFICATION FOR TAPIOCA SAGO (*SABOODANA*)

(First Revision)

UDC 664·273

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 1

November 1971

Indian Standard

SPECIFICATION FOR TAPIOCA SAGO (*SABOODANA*)

(First Revision)

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Indian Standard

SPECIFICATION FOR TAPIOCA SAGO (*SABOODANA*)

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 10 September 1971, after the draft finalized by the Edible Starches and Glucose Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 Sago is a processed food starch marketed in the form of small globules or pearls. In Hindi, it is known as *SABOODANA*. The name sago is derived from the original product which used to be manufactured from the starchy core of the stem of several palms, the principal being the sago palm (*Metroxylon sagu* and *M. rumphii*). Sago is manufactured in India from the starch obtained from the tubers of tapioca (*Manihot utilissima*).

0.3 This revision incorporates a number of important modifications, namely: (a) moisture content has been reduced from 12·0 percent to 11 percent; and (b) additional requirements of starch, protein, sulphur dioxide and crude fibre have been included. It is hoped that these modifications would improve the quality of sago and also safeguard consumer health, specially the convalescents.

0.4 In the formulation of this standard due consideration has been given to the relevant rules prescribed by the Government of India under the Prevention of Food Adulteration Act, 1954. This standard is, however, subject to the restrictions imposed under that Act, wherever applicable.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2 - 1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for sago (*SABOODANA*).

2. TERMINOLOGY

2.1 For the purpose of this standard, sago (*SABOODANA*) shall mean small hard globules or pearls made from the starch obtained from the tubers of manihot plants commonly known as cassava or tapioca (*Manihot utilissima*).

3. REQUIREMENTS

3.1 Description — The material shall be in the form of small hard globules or pearls and shall be pearl white in colour. It shall be free from fermented or musty or any other objectionable odours, from added sweetening or colouring matters, from adulterants, from fungal contamination and from insect infestation.

3.2 The material shall be made from starch obtained from sound tubers of tapioca, free from any fungal or bacterial contamination.

3.3 The material, when examined by the method prescribed in **15** of IS : 4706-1968*, shall be free from dirt, or other suspended and extraneous matter.

3.4 Gelatinization — When cooked and tested by the method prescribed in Appendix A, the quantity of starch passed into the gruel shall not exceed 30 percent by weight of the material taken for the test, and the individual globules or pearls shall retain the globular shape.

3.5 The material, manufactured from the starch obtained from the tubers of tapioca, shall comply with the requirements given in Table 1.

3.6 Sago shall be processed and packed under hygienic conditions (*see* IS : 2491-1963†).

4. PACKING AND MARKING

4.1 Packing — Unless otherwise agreed to between the purchaser and the vendor, the material shall be packed in clean, sound and dry new A-Twill jute bags (*see* IS : 1943-1964‡). The mouth of each bag shall be either machine stitched or rolled over and hand stitched; if hand stitched, the stitches shall be in two rows with at least 14 stitches in each row.

*Methods of test for edible starches.
†Code for sanitary conditions for food processing units.
‡Specification for A-twill jute bags (*revised*).

TABLE 1 REQUIREMENTS FOR SAGO (*SABOODANA*)

(*Clause* 3.5)

Sl No.	Characteristic	Requirement	Method of Test	
			Ref to Appendix	Cl of IS : 4706-1968*
(1)	(2)	(3)	(4)	(5)
i)	Moisture, percent by weight, *Max*	11	—	3
ii)	Total ash (dry basis), percent by weight, *Max*	0·4	—	4
iii)	Acid insoluble ash (dry basis), percent by weight, *Max*	0·10	—	5
iv)	Starch (on dry basis), percent by weight, *Min*	98	—	6
v)	Protein (N × 6·25) (on dry basis), percent by weight, *Max*	0·30	—	
vi)	Sulphur dioxide, ppm, *Max*	100	—	8
vii)	Crude fibre (on dry basis), percent by weight, *Max*	0·20	—	9
viii)	*p*H of aqueous extract	4·5 to 7·0	—	10
ix)	Colour of gelatinized alkaline paste in the porcelain cuvette on the Lovibond Scale, not deeper than	1 R + 3 Y	B	—

*Methods of test for edible starches.

4.2 Marking — Each pack shall be suitably marked so as to give the following information:

a) Name of the material;

b) Name of the manufacturer;

c) Batch or code number; and

d) Net weight, when packed.

4.2.1 Each container may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

5. SAMPLING

5.1 The method of drawing representative samples of the material and the criteria for conformity shall be as given in IS : 4662-1968*.

6. TESTS

6.1 Tests shall be carried out in accordance with the methods prescribed in **3.3**, **3.4** and col 4 and 5 of Table 1.

6.2 Quality of Reagents — Unless specified otherwise, pure chemicals shall be employed in tests and distilled water (*see* IS : 1070-1960†) shall be used where the use of water as a reagent is intended.

NOTE — ' Pure chemicals ' shall mean chemicals that do not contain impurities which affect the results of analysis.

6.3 Preparation of Material — Prepare the material for tests prescribed in **3.3** and col 4 and 5 of Table 1, as given in **6.3.1**.

6.3.1 Take about 100 g of the material and finely powder in a clean pestle and mortar so that the whole of it passes through 250-micron IS Sieve. Place this *prepared material* in a clean and dry stoppered glass bottle.

NOTE — In case 250-micron IS Sieve (conforming to IS: 460-1962‡) is not available, BS Test Sieve 60, ASTM Sieve 60, or Tyler Sieve 60, which have their apertures within the limits specified for this IS Sieve, may be used.

APPENDIX A

(*Clause* 3.4)

TEST FOR GELATINIZATION AND DETERMINATION OF STARCH IN GRUEL AFTER COOKING

A-1. PROCEDURE

A-1.1 Weigh accurately about 10 g of the material in a 200-ml conical flask. Add 80 ml of boiling water into the conical flask, connect it with an upright water-cooled condenser and heat it on a wire gauze using a Bunsen burner. (It is essential that the contents of the flask begin to boil within one minute of adding the boiling water.) Boil the contents of the flask briskly for exactly 15 minutes, after which remove the flame, disconnect the flask from the condenser and filter the contents of the flask through 850-micron IS Sieve. Collect the gruel in a tared porcelain dish.

*Methods for sample of starch.
†Specification for water, distilled quality (*revised*).
‡Specification for test sieves (*revised*).

Place the porcelain dish containing the gruel over a boiling water bath and evaporate the water from it until the residue becomes quite dry. Remove the dish from the boiling water bath and place it in an electric air-oven maintained at 110 ± 2°C over night. Cool the dish in a desiccator and weigh. Repeat heating in the oven at 110 ± 2°C, cooling and weighing at half hour intervals, till the difference between two successive weighings is less than one milligram. Note the lowest weight.

A-1.1.1 Examine the cooked globules or pearls on the sieve for their globular shape.

A-2. CALCULATION

A-2.1 Calculate as follows:

$$\text{Quantity of starch passed into the gruel, expressed as percentage by weight of the material taken for the test} = \frac{100\ w}{W}$$

where

w = weight in g of the dry residue obtained from the gruel, and

W = weight in g of the material taken for the test.

APPENDIX B

[*Table* 1, *Item* (ix)]

DETERMINATION OF COLOUR OF GELATINIZED ALKALINE PASTE

B-1. APPARATUS

B-1.1 Lovibond Tintometer

B-1.2 Porcelain Cuvette — supplied by the makers with the Lovibond Tintometer.

B-2. REAGENT

B-2.1 Sodium Hydroxide Solution — approximately 0·5 N prepared from sodium hydroxide, analytical reagent (*see* IS : 376-1969*).

*Specification for sodium hydroxide, analytical reagent (*first revision*).

B-3. PROCEDURE

B-3.1 Place about 10 g of the *prepared material* (**6.3.1**) in a clean and dry neutral glass beaker and add to it 95 ml of water. Heat the beaker with its contents on a boiling water-bath for about 15 minutes with continuous stirring till the material is gelatinized. Add 5 ml of sodium hydroxide solution to the gelatinized paste and stir well. Allow the slurry to cool.

B-3.2 Examination of Gelatinized Paste — Clean the porcelain cuvette with carbon tetrachloride to remove any oily or greasy film on it and allow it to dry. Fill the cuvette with the gelatinized paste (*see* **B-3.1**), and place it in position in the tintometer kept in the vertical position, suitable for measuring reflected light. Place along side of it such red and/or yellow Lovibond glasses as are necessary to match the colour shade of the gelatinized paste, observing the colour of the gelatinized paste and of the combination of Lovibond glasses through the eye piece.

B-4. REPORT

B-4.1 Report the colour of the gelatinized paste in terms of Lovibond units by summing up individually the values for the red and yellow Lovibond glasses as follows:

Colour reading of the gelatinized paste in the porcelain cuvette on the Lovibond Scale $= a\mathrm{R} + b\mathrm{Y}$

where

a = the sum total of the various red (R) Lovibond glasses used, and

b = the sum total of various yellow (Y) Lovibond glasses used.